

WHAT IS CLAIMED IS:

1. A core for a shell die used in casting a turbine bucket, the core comprising an elongated body shaped to create internal cooling passages in the bucket, said elongated body formed with at least one core support pin extending transversely of said elongated body and adapted to fix the core inside the shell die, said at least one core support pin having an elliptical shape in cross-section.
2. The core of claim 1 wherein said at least one core support pin is tapered along its length.
3. The core of claim 1 wherein said at least one core support pin is joined to said elongated body by a fillet.
4. The core of claim 1 wherein said at least one core support pin comprises three core support pins.
5. A shell die and core for use in casting turbine buckets wherein the shell die is provided with a plurality of core support bosses having core support pin holes therein and wherein said core comprises an elongated body having a corresponding plurality of core support pins adapted to be received in said core support pin holes, said core support pins having elliptical cross-sectional shapes and said core support pin holes having substantially identical elliptical shapes.
6. The shell die and core of claim 5 wherein said elliptical cross-sectional shapes are defined by major

and minor diameters (a, b), the major diameter aligned in a radial direction relative to the turbine bucket.

7. The shell die and core of claim 5 wherein each of said core support pins is tapered along its length.

8. The shell die and core of claim 5 wherein said at least one core support pin is joined to said elongated body by a fillet.

9. The shell die and core of claim 5 wherein said plurality of core support pins comprises three core support pins.

10. The shell die and core of claim 5 in further combination with a plug of elliptical cross-sectional shape adapted to seal an exit hole in a cast turbine bucket created by said core support pin.

11. A cast turbine bucket having at least one exit hole created therein during casting, said at least one exit hole having an elliptical cross-sectional shape and an elliptical plug closing said at least one exit hole.